

Patent Claims

1. Polymer mixture, comprising

5        a) a polymer matrix which is composed of a (meth)acrylate (co)polymer or of a mixture of (meth)acrylate (co)polymers with a Vicat softening point VSP (ISO 306-B50) of at least 104°C and/or of a (meth)acrylimide (co)polymer,

10      b) an impact modifier which is based on crosslinked poly(meth)acrylates and which does not have covalent bonding to the polymer matrix  
a),

15      c) from 1 to 15% by weight of plastics particles composed of crosslinked polymers based on polymethyl methacrylate, on polystyrene and/or on polysilicones, with a median particle size in the range from 1 to 30 µm,

25      where a), b) and c) give a total of 100% by weight, and where the polymer mixture may also comprise conventional additives, auxiliaries and/or fillers, and a test specimen injection-moulded from the polymer mixture simultaneously has the following properties:

30      a roughness value  $R_z$  to DIN 4768 of at least 0.7 µm,

a gloss ( $R\ 60^\circ$ ) to DIN 67530 of at most 40, and also a Vicat softening point VSP (ISO 306-B50) of at least 90°C.

35    2. Polymer mixture according to Claim 1, characterized in that the components are present with the following quantitative proportions

a) from 25 to 75% by weight

b) from 5 to 60% by weight  
c) from 1 to 15% by weight.

3. Polymer mixture according to Claim 1 or 2,  
5 characterized in that the impact modifier b) has a  
two- or three-shell structure.

4. Polymer mixture according to one or more of Claims  
10 1 to 3, characterized in that the polymer matrix  
a) is composed of a (meth)acrylate (co)polymer  
composed of from 96 to 100% by weight of methyl  
methacrylate and from 0 to 4% by weight of methyl  
acrylate, ethyl acrylate and/or butyl acrylate.

15 5. Polymer mixture according to one or more of Claims  
1 to 3, characterized in that the polymer matrix  
a) is a copolymer composed of methyl methacrylate,  
styrene and maleic anhydride.

20 6. Polymer mixture according to Claim 5,  
characterized in that the polymer matrix a) is a  
copolymer composed of  
  
from 50 to 90% by weight of methyl methacrylate,  
25 from 10 to 20% by weight of styrene and  
from 5 to 15% by weight of maleic anhydride.

7. Polymer mixture according to one or more of Claims  
1 to 3, characterized in that the constituents a)  
30 and b) of the polymer mixture are introduced  
individually or in the form of a compounded  
material which comprises the following components  
  
d) a low-molecular-weight (meth)acrylate  
35 (co)polymer,  
  
characterized by a solution viscosity in  
chloroform at 25°C (ISO 1628 - Part 6) smaller  
than or equal to 55 ml/g

e) an impact modifier based on crosslinked poly(meth)acrylates

5 f) a relatively high-molecular-weight (meth)acrylate (co)polymer,

10 characterized by a solution viscosity in chloroform at 25°C (ISO 1628 - Part 6) smaller than or equal to 65 ml/g and/or

g) a (meth)acrylate (co)polymer other than d),

15 characterized by a solution viscosity in chloroform at 25°C (ISO 1628 - Part 6) of from 50 to 55 ml/g

20 where each of the components d), e), f) and/or g) may be an individual polymer or else a mixture of polymers,

and where d), e), f) and/or g) give a total of 100% by weight,

25 and where the polymer mixture may also comprise conventional additives, auxiliaries and/or fillers and

30 where a test specimen produced from the polymer mixture of components d), e), f) and/or g) simultaneously has the following properties:

I. a tensile modulus (ISO 527) of at least 2600 MPa,

35 II. a Vicat softening point VSP (ISO 306-B50) of at least 109°C,

III. an impact strength (ISO 179-2D, flatwise) of at least 17 kJ/m<sup>2</sup>, and

IV. a melt index MVR (ISO 1133, 230°C/3.8 kg) of at least 1.5 cm<sup>3</sup>/10 min.

8. Polymer mixture according to Claim 7,  
5 characterized in that the components are present with the following quantitative proportions and give a total of 100% by weight:

10 d) from 25 to 75% by weight  
e) from 10 to 60% by weight  
f) and/or g) from 10 to 50% by weight.

9. Polymer mixture according to Claim 7 or 8,  
15 characterized in that component d) is a copolymer composed of methyl methacrylate, styrene and maleic anhydride.

10. Polymer mixture according to Claim 9,  
20 characterized in that component d) is a copolymer composed of

from 50 to 90% by weight of methyl methacrylate,  
from 10 to 20% by weight of styrene and  
from 5 to 15% by weight of maleic anhydride.

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11. Polymer mixture according to one or more of Claims 7 to 10, characterized in that component e) has a two- or three-shell structure.

30 12. Polymer mixture according to one or more of Claims 7 to 11, characterized in that component f) is a copolymer composed of methyl methacrylate, styrene and maleic anhydride.

35 13. Polymer mixture according to Claim 12,  
characterized in that component f) is a copolymer composed of

from 50 to 90% by weight of methyl methacrylate,

from 10 to 20% by weight of styrene and  
from 5 to 15% by weight of maleic anhydride.

14. Polymer mixture according to one or more of Claims  
5       7 to 13, characterized in that component g) is a  
homopolymer or copolymer composed of at least 80%  
by weight of methyl methacrylate and, where  
appropriate, up to 20% by weight of other monomers  
copolymizable with methyl methacrylate.  
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15. Polymer mixture according to Claim 14,  
characterized in that component g) is a copolymer  
composed of from 95 to 99.5% by weight of methyl  
methacrylate and from 0.5 to 5% by weight of  
15     methyl acrylate, ethyl acrylate and/or butyl  
acrylate.
16. Polymer mixture according to one or more of Claims  
20     1 to 15, characterized in that a lubricant is  
present as auxiliary.
17. Polymer mixture according to Claim 16,  
characterized in that stearyl alcohol is present  
as mould-release agent.  
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18. Polymer mixture according to one or more of Claims  
1 to 17, characterized in that it takes the form  
of a pelletized moulding composition.
- 30   19. Process for producing injection mouldings in a  
manner known per se, characterized in that use is  
made of a polymer mixture according to one or more  
of Claims 1 to 18 as starting material.
- 35   20. Injection moulding, capable of production in a  
process according to Claim 19.
21. Injection moulding according to Claim 20,  
characterized in that it has a roughness value  $R_z$

to DIN 4768 of at least 0.7 µm, a gloss (R 60°) to DIN 67530 of at most 40 and a Vicat softening point VSP (ISO 306-B50) of at least 90°C.

5 22. Injection moulding according to Claim 20 or 21, characterized in that it has one or more of the following properties

10 I. a tensile modulus (ISO 527) of at least 2600 MPa,

II. a Vicat softening point VSP (ISO 306-B50) of at least 108°C,

III. an impact strength (ISO 179-2D, flatwise) of at least 10 kJ/m<sup>2</sup>, and

15 IV. a melt index MVR (ISO 1133, 230°C/3.8 kg) of at least 0.5 cm<sup>3</sup>/10 min.

20 23. Use of the injection mouldings according to one or more of Claims 20 to 23 as parts of household appliances, of communication devices, or of devices for hobbies or sports, or as bodywork parts or parts of bodywork parts in the construction of automobiles, of ships or of aircraft.